

Application No. 10/625,080
Response to Office Action

Customer No. 01933

Listing of Claims:

Claims 1-14 (Canceled).

15. (New) A capacitive type sensor comprising:

an insulating substrate;

first and second electrodes mounted on the insulating
substrate to face each other; and

5 a gas sensitive film provided between the first and second
electrodes and supported by the insulating substrate;

wherein the gas sensitive film has a linear thermal
expansion coefficient of at least 2×10^{-5} per degree centigrade;

10 wherein the first and second electrodes have a linear
thermal expansion coefficient which is substantially the same as
the linear thermal expansion coefficient of the insulating
substrate and which is not more than 1×10^{-5} per degree
centigrade;

15 wherein said first and second electrodes each have a
thickness from 1 μm to 11 μm , inclusive; and

wherein a face-to-face distance between said first and
second electrodes is from 0.5 μm to 5 μm , inclusive.

16. (New) The capacitive type sensor according to claim 15,
wherein the gas sensitive film is a water vapor sensitive film,

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and a capacitance of the capacitive type sensor varies in accordance with an amount of water vapor absorbed by the water vapor sensitive film.

17. (New) The capacitive type sensor according to claim 16, wherein:

the insulating substrate consists essentially of a material that is selected from the group consisting of glass, quartz,
5 silicon, ceramics, and sapphire,

the water vapor sensitive film consists essentially of a material that is selected from the group consisting of a crosslinked polymer material, and an organic polymer material, and

10 the first and second electrodes each consists essentially of a material that is selected from the group consisting of Si, SiC, GaAs, and polysilicon.

18. (New) The capacitive type sensor according to claim 16, further comprising:

an upper water vapor sensitive film provided on the first and second electrodes and the water vapor sensitive film;

5 wherein a shielding film is provided in the upper water vapor sensitive film.

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19. (New) The capacitive type sensor according to claim 16, wherein the first and second electrodes are joined to the surface of the insulating substrate.

20. (New) The capacitive type sensor according to claim 19, wherein the first and second electrodes are formed by subjecting an electrically conductive substrate, joined to the insulating substrate, to polishing or etching.

21. (New) The capacitive type sensor according to claim 16, wherein:

the first electrode comprises a first electrode body and a plurality of first comb-electrode portions extending from the first electrode body;

the second electrode comprises a second electrode body and a plurality of second comb-electrode portions extending from the second electrode body;

the first and second comb-electrode portions are alternately disposed with a predetermined face-to-face distance therebetween; and

the water vapor sensitive film is disposed between and in contact with the first and second comb-electrode portions, and forms a plurality of vertically arranged capacitors with the first and second comb-electrode portions.

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22. (New) The capacitive type sensor according to claim 21, further comprising an upper water vapor sensitive film provided on the first and second electrodes and the water vapor sensitive film,

5 wherein a shielding film is provided in the upper water vapor sensitive film above and near the first and second comb-electrode portions.

23. (New) The capacitive type sensor according to claim 16, wherein:

the first electrode comprises a first electrode body, a first straight electrode portion extending from the first
5 electrode body, and a plurality of first annular electrode portions extending from the first straight electrode portion;

the second electrode comprises a second electrode body, a second straight electrode portion extending from the second electrode body, and a plurality of second annular portions
10 extending from the second straight electrode portion;

the first and second annular electrode portions are coaxially and alternately disposed with a predetermined face-to-face distance therebetween; and

the water vapor sensitive film is disposed between and in
15 contact with the first and second annular electrode portions, and

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forms a plurality of vertically arranged capacitors with first and second annular electrode portions.

24. (New) The capacitive type sensor according to claim 16, wherein:

the first electrode comprises a first electrode body, at least one first straight electrode portion extending from the first electrode body, and a plurality of first toothed electrode portions extending perpendicularly from the at least one first straight electrode portion;

the second electrode comprises a second electrode body, a plurality of second straight electrode portions extending from the second electrode body, and a plurality of second toothed electrode portions extending perpendicularly from each of the second straight electrode portions;

adjacent ones of the first straight electrode portion, the first toothed electrode portions, the second straight electrode portions, and second toothed electrode portions are disposed to face one another with a predetermined face-to-face distance; and

the water vapor sensitive film is disposed between and in contact with adjacent portions of the first straight electrode portion, the first toothed electrode portions, the second straight electrode portions, and second toothed electrode

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portions, and forms a plurality of vertically arranged capacitors with the adjacent portions.

25. (New) The capacitive type sensor according to claim 16, wherein:

the first electrode comprises a first electrode body, and a lower electrode portion which extends from the first electrode body and which includes a plurality of first toothed electrode portions disposed at equal intervals;

the first toothed electrode portions extend upward perpendicularly from an upper face of the lower electrode portion to form lower comb electrodes;

the second electrode includes a second electrode body and an upper electrode portion extending from the second electrode body;

the upper electrode portion includes an upper wall having a plurality of second toothed electrode portions disposed at equal intervals, and side walls fixed at bottom faces thereof to the insulating substrate;

the second toothed electrode portions extend downward perpendicular from the upper wall of the upper electrode portion to form upper comb electrodes;

the upper comb electrodes and the lower comb electrodes are disposed to face one another with a predetermined face-to-face distance therebetween; and

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the water vapor sensitive film is disposed between and in
contact with the upper and lower comb electrodes, and forms a
plurality of vertically arranged capacitors with the upper and
25 lower comb electrodes.